



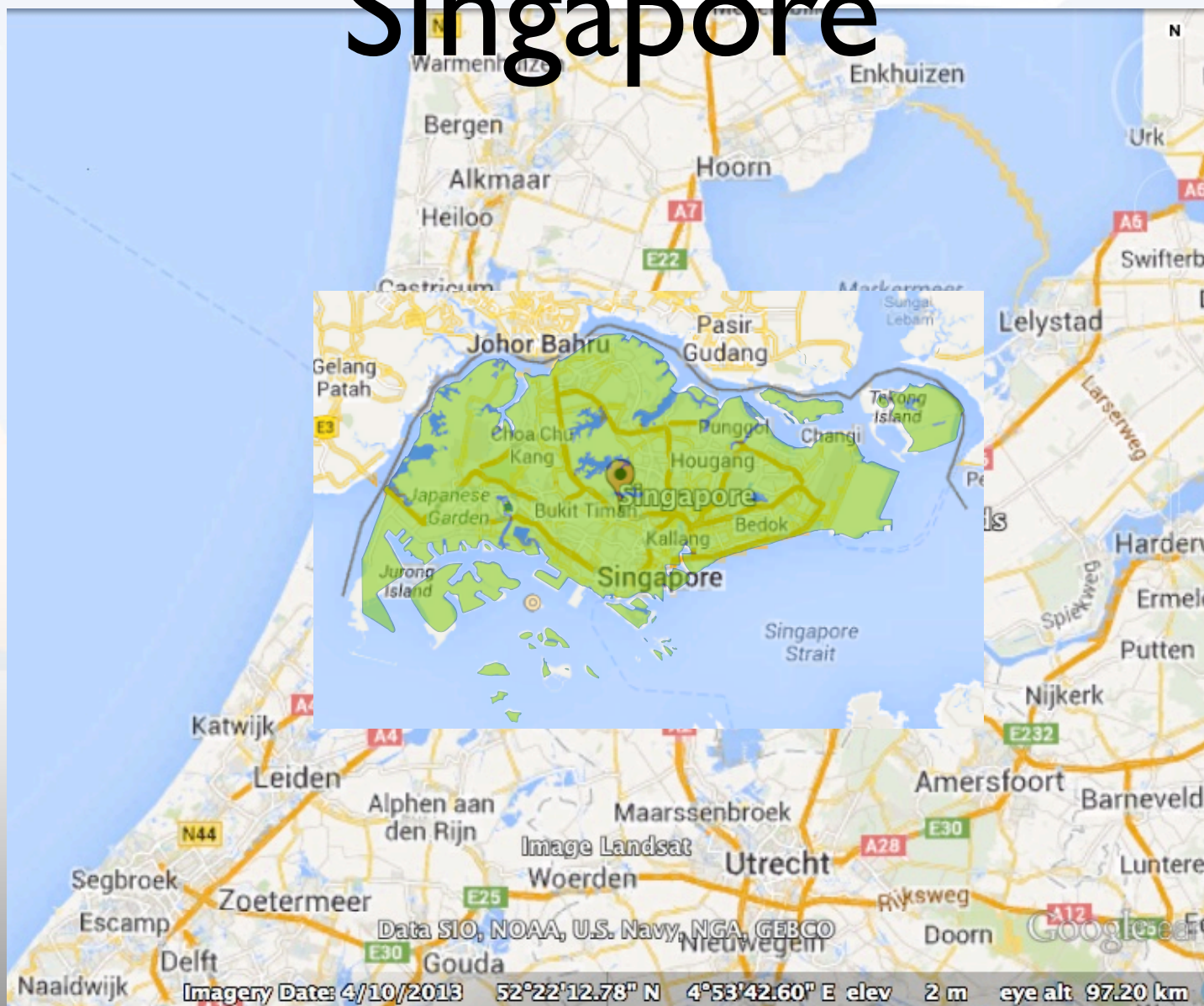
# The Mother of All Disciplines?

David S. Rosenblum  
Dean, School of Computing  
National University of Singapore





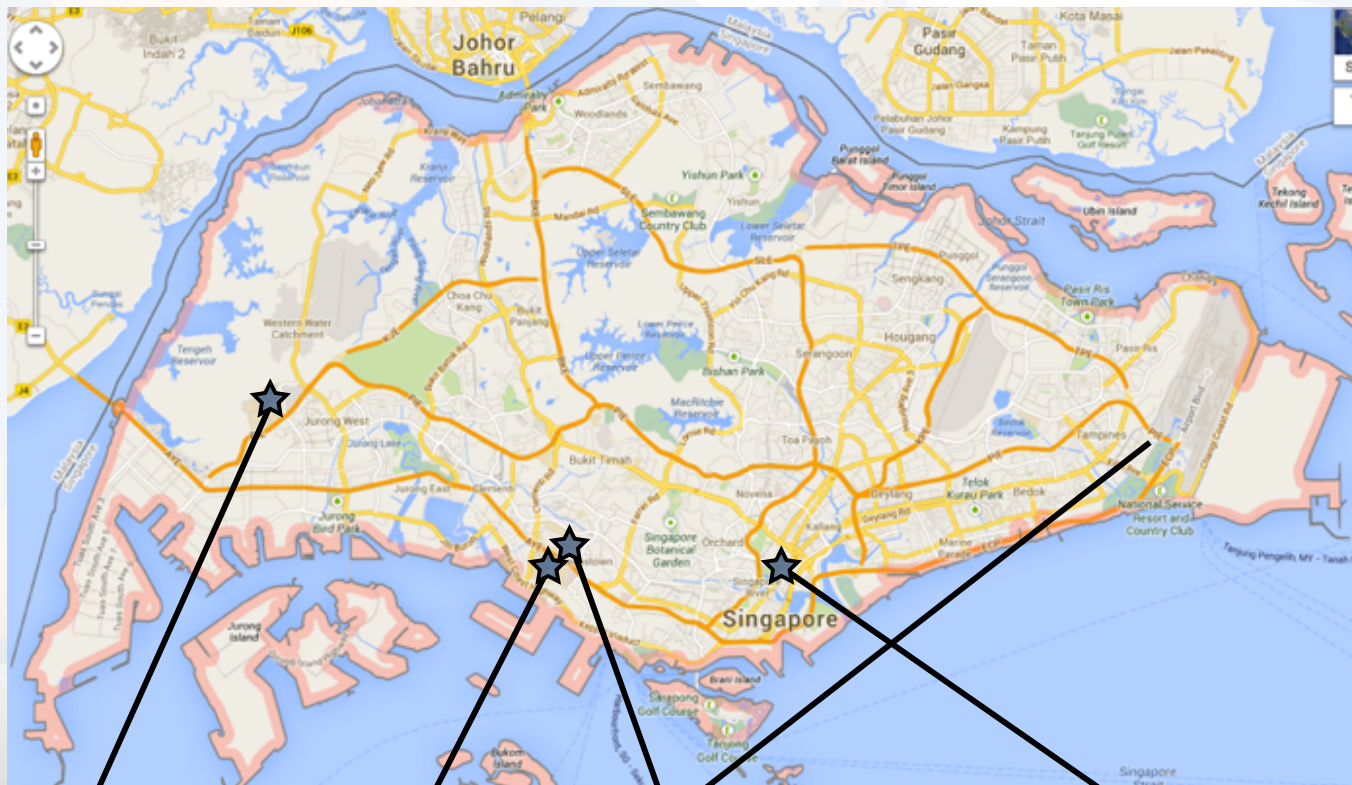
# Singapore







# Singapore Universities



# National University of Singapore



- ✓ Founded in 1905 as a medical school
- ✓ Research-intensive beginning in the 1990s
- ✓ Tenure-track system in 2000
- ✓ 37,000 students  
(27,000 undergrad + 10,000 postgrad)
- ✓ Top-ranked in Asia

# NUS and Globalization

“A leading global university  
centered in Asia,  
influencing the future”

- ✓ **Many** undergrads spend time overseas
  - NUS Overseas Colleges*
  - University- and faculty-level internships*
  - Student exchanges with many universities*

# NUS Faculties

Faculty of Arts and Social Sciences

Business School

**School of Computing**

Faculty of Dentistry

School of Design & Environment

Faculty of Engineering

Faculty of Law

*University Scholars Program*

Yong Loo Lin School of Medicine

Yong Siew Toh Conservatory of Music

Saw Swee Hock School of Public Health

Faculty of Science

Yale-NUS College

Lee Kuan Yew School of Public Policy

Duke-NUS Graduate Medical School  
Singapore

*NUS Graduate School for Integrative  
Sciences and Engineering*

# School of Computing

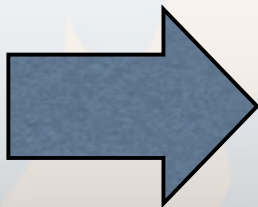
- ✓ Established in 1998 from Faculty of Science
- ✓ 2 Departments:  
*Computer Science, Information Systems*
- ✓ 111 Academic Staff (Tenure-Track & Teaching Track)
- ✓ 115 Research Staff
- ✓ 1650 Undergraduate Students *(and we're hiring!)*
- ✓ 180 Masters Students
- ✓ 370 PhD Students
- ✓ S\$10 million+ in research income per annum



**QS WORLD UNIVERSITY RANKINGS BY SUBJECT  
2013 - COMPUTER SCIENCE & INFORMATION  
SYSTEMS**

**#8 in the World**

**#1 in Asia**



QS RANK ▲	SCHOOL NAME	COUNTRY ▼	OVERALL ▼
1	<u>Massachusetts Institute of Technology (MIT)</u>	United States	96.70
2	<u>Stanford University</u>	United States	92.10
3	<u>University of Oxford</u>	United Kingdom	92.00
4	<u>Carnegie Mellon University</u>	United States	90.50
5	<u>University of Cambridge</u>	United Kingdom	89.80
6	<u>Harvard University</u>	United States	88.40
7	<u>University of California, Berkeley (UCB)</u>	United States	88.00
8	<u>National University of Singapore (NUS)</u>	Singapore	87.20
9	<u>ETH Zurich (Swiss Federal Institute of Technology)</u>	Switzerland	87.10
10	<u>University of Hong Kong</u>	Hong Kong S.A.R., China	84.00



# Constraints and Challenges

- Demographics
- Constraints from Ministry of Education
  - Undergraduate population of international students is decreasing to 15% overall, 30% for SoC*
- Unpopularity of computing among Singapore students
- Slowly emerging IT industry
- Slowly emerging entrepreneurial ecosystem
- Low priority of computing in strategic research funding
- Review processes for grant proposals
- No regional research funding body



# A Golden Age for Computing

- ✓ Our field now underpins virtually every facet of human endeavor
- ✓ This creates tremendous opportunity for collaboration in research and education
- ✓ And the research collaborations need not be “service-oriented”

# Example

## Big Data Analytics for Healthcare

- Understanding and predicting disease in Singapore, by integrating modeling and analyzing a vast range of patient data
  - ✓ 90% of high school graduates are nearsighted
  - ✓ Average age of heart failure is 8 years younger in Singapore than in New Zealand
  - ✓ Diabetes among heart failure cases is 55% in Singapore vs 27% in New Zealand
  - ✓ 11.3% of Singaporeans have diabetes, growing to 1 million people by 2050
    - Obesity a major factor for Chinese and Malays but not for Indians*



# Example

## Modeling and Predicting Disease Propagation

- Exploitation of mobile devices for location tracking and for data management tasks

- ✓ Spread of dengue fever in Singapore

*Two-thirds of cases have unknown geographic origin*

- ✓ Spread of MRSA in Singapore hospitals

*Singapore hospitals have a 5% conversion rate among inpatients*



# Making It Happen

- Cross-faculty special-interest groups
- Seed funding from faculties involved
- Seed funding from NUS ODPRT
- Strategic funding from MOE and NRF

*Must be done **top-down and bottom-up***

# Some Dark Clouds on



MIT

IEEE  
SPECTRUM

Follow on: [f](#) [t](#) [in](#) [+](#) [m](#)

Topics ▾

Reports ▾

At Work | Education | Feature

## The STEM Crisis

Forget the dire predictions for scientists, technologists, and mathematicians

By Robert N. Charette

Posted 30 Aug 2013 | 17:47 GMT



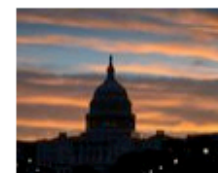
Fred R. Charette

Paul Krugman

The  
Atlantic

POLITICS BUSINESS TECH ENTERTAINMENT HEALTH EDUCATION SEXES NATIONAL GLOBAL

Special Reports In Focus Events E-books Newsletters **JUST IN** Shutdown Watch: The Final Hours National Journal



What Happened  
to Negotiation?

Can We  
Green in

## The Ph.D Bust: America's Awful Market for Young Scientists—in 7 Charts

Perhaps it's time to start talking about a STEM surplus?

JORDAN WEISSMANN | FEB 20 2013, 2:23 PM ET

16k

Like

1,972

Tweet

478

+1

365

Share

More ▾

Politicians and businessmen are fond of talking about America's scientist shortage -- the dearth of engineering and lab talent that will inevitably leave us sputtering in the global economy.

But perhaps it's time they start talking about our *scientist surplus* instead.

I am by no means the first [person to make this point](#). But I was compelled to try and illustrate it after reading [a report](#) from *Inside Higher Ed* on this weekend's gloomy gathering of the American Association for the Advancement of Science. In short, job prospects for young science Ph.D.'s haven't been looking so hot these last few years, not only in the life sciences, which have been weak for some time, but also in fields like engineering.

The graphs below, drawn from [National Science Foundation data](#) and some of my own calculations, depict Ph.D. employment at graduation. It's not a perfect